

FULTON COUNTY PUBLIC WORKS DEPARTMENT TRANSPORTATION PLANNING

PROJECT CONCEPT REPORT

Butner Road Bridge Replacement over Camp Creek

Fulton County Project Number: T227

County: FULTON COUNTY

May 28, 2010

Recommendation for approval:

DATE _____

Angela Parker
Director of Public Works

DATE _____

Richard Coates
Assistant Director of Public Works

DATE _____

Antonio Valenzuela
County Transportation Planning Administrator

Need and Purpose: The existing bridge structure at Butner Road over Camp Creek has been inspected and evaluated by the Georgia Department Of Transportation and is listed in their Bridge Inventory Data listing dated October 20th, 2004. The bridge structure I.D. no. is 121-0355-0. The bridge was constructed in 1946 and is currently posted for 20 Tons load and opens to traffic. Currently, the existing narrow bridge has a sufficiency rating of 19, which is very low and requires immediate attention to maintain the traffic flow from Camp Creek Parkway across Camp Creek on Butner Road.

The primary purpose of the proposed project is to replace a deficient bridge at the crossing of Butner Road and the Camp Creek and to provide additional capacity along the corridor and to provide an efficient and safe movement of traffic that is consistent with the functional classification of a minor arterial as well as upgrades the bridge crossing to the accepted level of HS 20-44 of the AASHTO standards for bridges.

Description of the proposed project: A new bridge is proposed to replace the existing Butner Road Bridge near Camp Creek Parkway / Butner Road Intersection. The proposed bridge will be wide enough to accommodate four traffic lanes of 12ft wide and 24in curb and gutter and 12 feet wide pedestrian sidewalk on the west side to tie into the multi-use trail off the bridge and six foot sidewalk on the east side. There will be one SB traffic lane, one NB Left turn lane, one NB through traffic lane and one NB right turn lane. Both the left turn lane and the right turn lane will extend on to the proposed bridge to furnish free flow and stacking length up to the intersection with Camp Creek Parkway.

No intersection improvements at Camp Creek Parkway are included with this concept. Bridge and the roadway north of the bridge will be designed for a four lane section and roadway south of the bridge will be designed for a two lane section. Project must be let in conjunction with intersection work so as to allow a left turn lane from Butner Road to Camp Creek Parkway and line up the thru lanes. If an intersection project is not let concurrently with this project then the roadway would be striped for a two lane section.

The length of the bridge shall be approximately 90 ft for alternative #1, 130 ft for alternative #2, and 130 ft for alternative #3. The new bridge elevation will be raised depending on the HEC-RAS study but at minimum it will be maintained at about two feet above the elevation of the existing bridge. The approach road on each side of the bridge shall be widened to match the existing road approaching this bridge. The project begins approximately 1200 feet south of the Camp Creek Parkway intersection, and extends north along Butner Road to Camp Creek Parkway intersection. The logic behind the chosen termini is to ensure the highest level of service at the Camp Creek Parkway/ Butner road intersection. Please refer to location map attached.

Is the project located in a Non-attainment area? X Yes No.

PDP Classification: Major Minor X

Federal Oversight: Full Oversight (), Exempt(X), State Funded (), or Other ()

Functional Classification: Urban Minor Arterial

Route Number(s): _____ **State Route Number(s):** _____

Traffic (AADT):

Current Year: (2012) 6300 vpd Design Year: (2032) 9700 vpd.

Traffic Data:

CR 1374 - Butner Road over Camp Creek

2007 ADT: 5610 vpd

2012 ADT: 6300 vpd

2032 ADT: 9700 vpd

2032 DHV: 875 vph

Directional Dist. = 55/45

24-hr T% = 5% SU = 3% and COMB = 2%

T% = 4%

Existing design features:

- Typical Section: Two lane traffic (lane width is less than 12 ft.)
- Posted speed 45 mph Minimum radius for curve: N/A
- Maximum super-elevation rate for curve: N/A
- Maximum grade: 5 % (List mainline, cross roads, and driveways)
- Width of right of way: 70 ft.
- Major structures: 100 FT SPAN BRIDGE, WIDTH = 25, SUFFICIENT RATING = 19
- Major interchanges or intersections along the project: BUTNER ROAD/CAMP CREEK PKWY. INTERSECTION
- Existing length of roadway segment and the beginning mile logs for each county segment. For new location projects, the existing length of roadway is zero (0).

Proposed Design Features:

- Proposed typical section(s): Urban 4-lane with curb and gutter, 12'-0" & 6'-0" feet wide pedestrian sidewalks respectively on each side.
- Proposed Design Speed Mainline 45 mph
- Proposed Maximum grade Mainline 5 %; Maximum grade allowable 5 %.
- Proposed Maximum grade Side Street NA %; Maximum grade allowable NA %.
- Proposed Maximum grade driveway NA %
- Proposed Minimum radius for curve NA Maximum radius allowable NA
- Proposed Maximum super-elevation rate for curve: NA
- Proposed Maximum degree of curve NA .; Maximum degree allowable NA .
- Right of way
 - Width 100 FT
 - Easements: Temporary (X), Permanent (), Utility (), Other ().
 - Type of access control: Full (), Partial (), By Permit (X), Other ().

- Number of parcels: 5 Number of displacements: NONE
 - Business: X
 - Residences: X
 - Mobile homes: _____
 - Other: _____
- Structure:
 - Bridges: For all bridge alternatives, the bridge will be 72'-5" wide (Out-to-Out) that provides for four 12 ft travel lanes, One 12'-0" sidewalk on the west side and one 6'-0" sidewalk on the east side, two 24" curb & gutter, and two 1'-2½" parapets. End bents will be parallel and built at 90°-00'-00" to the Camp Creek centerline to align with the flood flow. The proposed PGL profile will be approximately 2.0 ft above the existing grade, measured as shown on the roadway profile. This proposed grade would provide for a minimum of 2 ft freeboard and a minimum clearance below the superstructure low chord for a 50-year flood stage design year per GDOT stipulations in the Manual for Hydrological crossings.

Design Alternative 1. Single Span Type III Beam Bridge Structure

This proposed bridge alternative consists of a single span 90.0 ft long with vertical cast-in-place concrete abutments. The superstructure will consist of a standard 45 inch deep precast prestressed concrete Type III PSC beams supporting a cast in place concrete deck. The entire superstructure will be supported on two vertical cast-in-place abutments on pile with wingwalls. The face of the abutment wall to the face of the abutment wall length of the proposed bridge is 90± ft. This alternative doesn't require any piers in the creek. The downside of this alternative is that the two abutments require pile foundations and a lot of cast-in place-concrete, thus making it the most expensive alternative.

Design Alternative 2. Two Span PSC Beam Bridge Structure

This proposed bridge alternative is 130 ft long and consists of two 65 ft spans with spill through end bents. The superstructure will consist of standard AASHTO Type II (36 inch deep) precast prestressed concrete (PSC) beams supporting a cast in place concrete decks. The entire superstructure will be supported in the middle on one concrete intermediate bent on pile footings and at the end on two pile end bents. The toe of the endroll to toe of endroll length of the proposed bridge is 100± ft. This alternative increases the channel opening under the bridge, so it works better hydraulically. The downside of this alternative is that it has a pier in the creek, thus requires cofferdams during construction and raises construction cost.

Design Alternative 3. Single Span 130 ft Bulb Tee PSC Beam Bridge Structure

The proposed bridge consists of single span 130 ft long with spill through end bents. The superstructure will consist of standard Bulb Tee (65 inch deep) precast pre-stressed concrete (PSC) beams supporting a cast-in place concrete deck. The entire superstructure will be supported on two end bents on pile. The toe of the end-roll to toe of end-roll length of the proposed bridge is 100ft±. This alternative is the most economical design because no costly concrete abutments and cofferdams are needed. This alternative also works better hydraulically than the other two alternatives.

For all three bridge alternatives see Concept Layouts and associated cost comparison.

Retaining walls

- Retaining walls will be required in all four quadrants to avoid encroachment on the FEMA floodplain for this site. These retaining walls will range in height from 5'-20' and 50-100' feet long that run parallel to the shoulder lines.
- Major intersections and interchanges. BUTNER ROAD/CAMP CREEK PKWY INTERSECTION
- Traffic control during construction: Traffic will be detoured from the existing bridge while the new bridge is being built on the existing bridge location
- Design Exceptions to controlling criteria anticipated:

	<u>UNDETERMINED</u>	<u>YES</u>	<u>NO</u>
HORIZONTAL ALIGNMENT:	()	()	(x)
ROADWAY WIDTH:	()	()	(x)
SHOULDER WIDTH:	()	()	(x)
VERTICAL GRADES:	()	()	(x)
CROSS SLOPES:	()	()	(x)
STOPPING SIGHT DISTANCE:	()	()	(x)
SUPERELEVATION RATES:	()	()	(x)
HORIZONTAL CLEARANCE:	()	()	(x)
SPEED DESIGN:	()	()	(x)
VERTICAL CLEARANCE:	()	()	(x)
BRIDGE WIDTH:	()	()	(x)
BRIDGE STRUCTURAL CAPACITY:	()	()	(x)

- Design Variances; N/A
- Environmental concerns: Wetland Section 404 Permit
- Level of environmental analysis:
 - Are Time Savings Procedures appropriate? Yes (), No (),
 - Categorical exclusion (),
 - Environmental Assessment/Finding of No Significant Impact (FONSI) (), or
 - Environmental Impact Statement (EIS) ().
- Utility involvements:
 - Graystone Power Corporation
 - Bellsouth Transportation Improvement Group

- City of Atlanta Depart. of Watershed Management
- Colonial Pipeline Company
- Plantation Pipeline Company

Project responsibilities:

- Design: FTC, Inc.
- Right of Way Acquisition: FTC, Inc.
- Relocation of Utilities: FTC, Inc.
- Letting to contract: Fulton County
- Supervision of construction: Fulton County
- Providing material pits: Contractor.
- Providing detours: Contractor

Coordination

- Initial Concept Meeting date and brief summary- *Attach minutes.*
- Concept meeting date and brief summary- *Attach minutes.*
- FEMA – *No rise certificate*
- Public involvement – *PIOH*
- Local government comments. *See attached minutes of meeting with C.O.A.*
- Other projects in the area. - *None*
- Railroads *N/A*

Scheduling – Responsible Parties’ Estimate

- Time to complete the environmental process: 2 Months.
- Time to complete preliminary construction plans: 3 Months.
- Time to complete right of way plans: 6 Months.
- Time to complete the Section 404 Permit: 6 Months.
- Time to complete final construction plans: 8 Months.
- Time to complete to purchase right of way: 6 Months.
- List other major items that will affect the project schedule: 2 Months.

Other alternates considered: *(Describe in summary and coordinate with environmental. If rejected ensure environmental is in agreement).*

Comments: *As appropriate*

Roadway Cost Estimates:

1	Estimated Construction Cost (Roadway)	\$1,076,342.35
2	E & C Rate @10%,	\$107,634.53

3	Inflation 2% @ 1 Year	\$23,679.53
4	Right-of-way	\$40,000.00
5	Reimbursable Utilities	\$0.00
	Sub-total (Roadway)	\$1,247,656.12

Bridge Cost Estimate:

Alternative 1: \$1,493,188.00

Alternative 2: \$1,362,662.00

Alternative 3: \$1,250,233.00

Total Cost Estimate (Roadway plus Bridge):

Alternative 1: \$1,493,188.00 + \$1,247,656.12= \$2,740,844.12

Alternative 2: \$1,362,662.00 + \$1,247,656.12= \$2,610,318.12

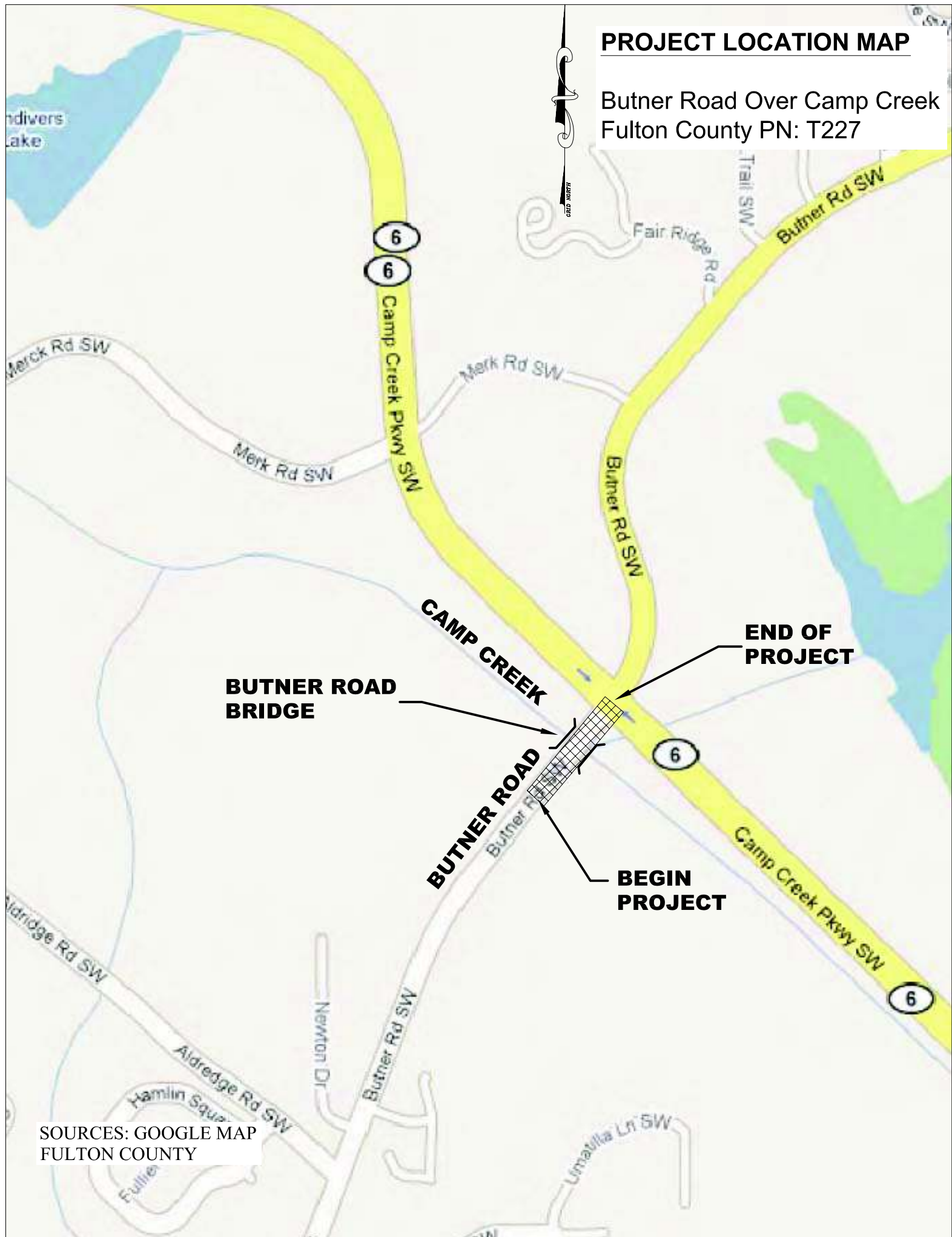
Alternative 3: \$1,250,233.00 + \$1,247,656.12= \$2,497,889.12

Attachments:

1. Sketch location map
2. Traffic Analysis
3. Hydraulic Design Considerations
4. Typical Sections
5. Concept Road Layout - Plan and Profile
6. Roadway Construction Cost Estimate
7. Bridge Design Alternatives and Bridge Construction Cost Estimate
8. Bridge Inventory Data
9. Fulton County / City of Atlanta Construction Cost Division
10. Minutes of Meeting

PROJECT LOCATION MAP

Butner Road Over Camp Creek
Fulton County PN: T227



SOURCES: GOOGLE MAP
FULTON COUNTY

TRAFFIC ANALYSIS OF QUEUE LENGTH

The year 2009 traffic volumes were used to calculate the required storage length necessary for right turning traffic on Butner Road. The queue length of the turning movements and through traffic was calculated using the following procedures:

$$\begin{array}{l} \text{Storage Length (feet)} = \% \text{ Effective red} \times \text{turning volume} \times \text{cycle length} \times \text{unit conversion} \times \text{headway factor} \times \text{length of vehicle} \end{array}$$

Storage Length	=	queue length in feet
% Effective red	=	% of cycle length when turning movement has "red" indication
Traffic Volume	=	right turn volume
Cycle Length	=	110 seconds
Unit Conversion	=	1 hour/3600 seconds
Headway Factor	=	1.5
Length of Vehicle	=	20 feet

Northbound Butner Road at Camp Creek Pkwy

$$\begin{array}{l} \text{NB Right Turn Queue Length} = 0.65 \times 193 \times 110 \times 1/3600 \times 1.5 \times 20 \\ \text{Queue Length} = 115 \text{ feet} \end{array}$$

Two Alternatives:

$$\begin{array}{l} \text{1) NB Left/Thru Lane Queue Length} = 0.65 \times 254 \times 110 \times 1/3600 \times 1.5 \times 20 \\ \text{Queue Length} = 151 \text{ feet} \end{array}$$

$$\begin{array}{l} \text{2) NB Right/Thru Lane Queue Length} = 0.65 \times 227 \times 110 \times 1/3600 \times 1.5 \times 20 \\ \text{Queue Length} = 135 \text{ feet} \end{array}$$

In case 1, the northbound right turn bay needs to be at least 151 feet in length so that it will not be blocked by the through traffic lane in the case where thru and left turn traffic share a lane.

In case 2, the northbound right turn bay will need to be 135 feet in length so that it will not be blocked by the through traffic lane.

Additionally in case 2, a sufficient length of left turn lane should be provided to store the proposed vehicular turning traffic. For 45 vehicles that distance is 50 feet.

It is recommended that the 100-foot taper begin at the end of the bridge and that a 12-foot right turn lane be constructed from the taper to the intersection. This will provide $180 \pm$ feet of right-turn storage.

LONG REPORT												
General Information						Site Information						
Analyst MAAI Agency or Co. Date Performed 2/27/2009 Time Period AM Peak Hour						Intersection Camp Creek Pkwy @ Butner Rd Area Type All other areas Jurisdiction Fulton County Analysis Year 2009 existing						
Intersection Geometry												
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> <p>Grade = -3</p> <p>Grade = 0</p> </div> <div style="width: 50%;"> <p>Grade = 0</p> <p>Show North Arrow</p> <p>= T = R = L = TR = LT = LR = LTR</p> <p>Grade = 3</p> </div> </div>												
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	103	1292	32	82	682	21	27	227	193	13	58	10
% Heavy veh	4	4	4	4	4	4	0	4	0	0	4	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Arrival type	3	3	3	3	3	3		3			3	
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Ped/Bike/RTOR Volume	0		0	0		0	0		98	0		10
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0		12.0			12.0	
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0		0			0	
Ped timing	3.2			3.2			3.2			3.2		
	Excl. Left	EW Perm	03	04	NS Perm	06	07	08				
Timing	G = 6.0	G = 75.0	G =	G =	G = 54.0	G =	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 150.0						

VOLUME ADJUSTMENT AND SATURATION FLOW RATE WORKSHEET												
General Information												
Project Description <i>Butner Road Bridge Replacement Project</i>												
Volume Adjustment												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume	103	1292	32	82	682	21	27	227	193	13	58	10
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow Rate	114	1436	36	91	758	23	30	252	106	14	64	0
Lane Group	L	T	R	L	T	R		LTR			LTR	
Adj. flow rate	114	1436	36	91	758	23		388			78	
Prop. LT or RT	0.000	--	0.000	0.000	--	0.000	0.077	--	0.273	0.179	--	0.000
Saturation Flow Rate												
Base satflow	1900	1900	1900	1900	1900	1900		1900			1900	
Num. of lanes	1	2	1	1	2	1	0	1	0	0	1	0
fW	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
fHV	0.962	0.962	0.962	0.962	0.962	0.962		0.975			0.968	
fg	1.000	1.000	1.000	1.000	1.000	1.000		0.985			1.015	
fp	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
fbb	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
fa	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
fLU	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
fLT	0.950	1.000	--	0.950	1.000	--		0.973	--		0.912	--
Secondary fLT	0.267		--	0.059		--			--			--
fRT	--	1.000	0.850	--	1.000	0.850	--	0.963		--	1.000	
fLpb	1.000	1.000	--	1.000	1.000	--		1.000	--		1.000	--
fRpb	--	1.000	1.000	--	1.000	1.000	--	1.000		--	1.000	
Adj. satflow	1736	3471	1553	1736	3471	1553		1710			1703	
Sec. adj. satflow	488		--	109		--			--			--

CAPACITY AND LOS WORKSHEET												
General Information												
Project Description Butner Road Bridge Replacement Project												
Capacity Analysis												
	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R		LTR			LTR	
Adj. flow rate	114	1436	36	91	758	23		388			78	
Satflow rate	1736	3471	1553	1736	3471	1553		1710			1703	
Lost time	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Green ratio	0.57	0.50	0.50	0.57	0.50	0.50		0.36			0.36	
Lane group cap.	329	1736	777	127	1736	777		616			613	
v/c ratio	0.35	0.83	0.05	0.72	0.44	0.03		0.63			0.13	
Flow ratio		0.41	0.02		0.22	0.01		0.23			0.05	
Crit. lane group	N	Y	N	N	N	N		Y			N	
Sum flow ratios	0.68											
Lost time/cycle	15.00											
Critical v/c ratio	0.76											
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R		LTR			LTR	
Adj. flow rate	114	1436	36	91	758	23		388			78	
Lane group cap.	329	1736	777	127	1736	777		616			613	
v/c ratio	0.35	0.83	0.05	0.72	0.44	0.03		0.63			0.13	
Green ratio	0.57	0.50	0.50	0.57	0.50	0.50		0.36			0.36	
Unif. delay d1	16.4	32.0	19.2	27.8	24.0	19.0		39.7			32.2	
Delay factor k	0.11	0.37	0.11	0.28	0.11	0.11		0.21			0.11	
Increm. delay d2	0.6	3.5	0.0	17.6	0.2	0.0		2.1			0.1	
PF factor	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Control delay	17.1	35.4	19.2	45.4	24.2	19.0		41.8			32.3	
Lane group LOS	B	D	B	D	C	B		D			C	
Apprch. delay	33.8			26.2			41.8			32.3		
Approach LOS	C			C			D			C		
Intersec. delay	32.5			Intersection LOS						C		

SUPPLEMENTAL UNIFORM DELAY WORKSHEET FOR LEFT TURNS FROM EXCLUSIVE LANES WITH PROTECTED AND PERMITTED PHASES

General Information

Project Description *Butner Road Bridge Replacement Project*

v/c Ratio Computation

	EB	WB	NB	SB
Cycle length, C (s)	150.0			
Prot. phase eff. green intvl, g (s)	6.0	6.0		
Opposed queue eff. green intvl, g _q (s)	21.36	54.28		
Unopposed green intvl, g _u (s)	58.64	25.72		
Red time, r(s)	64.0	64.0		
Arrival rate, q _a (veh/s)	0.03	0.03		
Prot. phase departure rate, s _p (veh/s)	0.482	0.482		
Perm. phase departure rate, s _s (veh/s)	0.18	0.09		
X _{perm}	0.23	0.83		
X _{prot} (N/A for lagging left-turns)	0.77	0.61		

Uniform Queue Size and Delay Computations

Queue at start of green arrow, Q _a	2.03	1.62		
Queue at start of unsaturated green, Q _u	0.68	1.37		
Residual queue, Q _r	0.00	0.00		
Uniform delay, d ₁	16.4	27.8		

Uniform Queue Size and Delay Equations

	Case	Q _a	Q _u	Q _r	d ₁
If X _{perm} ≤ 1.0 & X _{prot} ≤ 1.0	1	q _a r	q _s g _q	0	$[0.5/(q_a C)][rQ_a + Q_a^{2\eta(s_p - q_a)} + g_q Q_u + Q_u^{2\eta(s_s - q_a)}$
If X _{perm} ≤ 1.0 & X _{prot} > 1.0	2	q _a r	Q _r + q _a g _q	Q _a - g(s _p - q _a)	$[0.5/(q_a C)][rQ_a + g(Q_a + Q_r) + g_q(Q_r + Q_u) + Q_u^{2\eta(s_s - q_a)}$
If X _{perm} > 1.0 & X _{prot} ≤ 1.0	3	Q _r + q _a r	q _a g _q	Q _u - g _u (s _s - q _a)	$[0.5/(q_a C)][g_q Q_u + g_u(Q_a + Q_r) + r(Q_r + Q_a) + Q_a^{2\eta(s_p - q_a)}$
If X _{perm} ≤ 1.0 (lagging lefts)	4	0	q _a (r + g _q)	0	$[0.5/(q_a C)][r + g_q]Q_u + Q_u^{2\eta(s_s - q_a)}$
If X _{perm} > 1.0 (lagging lefts)	5	Q _u - g _u (s _s - q _a)	q _a (r + g _q)	0	$[0.5/(q_a C)][r + g_q]Q_u + g_u(Q_u + Q_a) + Q_a^{2\eta(s_p - q_a)}$

BACK-OF-QUEUE WORKSHEET												
General Information												
Project Description <i>Butner Road Bridge Replacement Project</i>												
Average Back of Queue												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane group	L	T	R	L	T	R		LTR			LTR	
Init. queue/lane	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Flow rate/lane	114	1436	36	91	758	23		388			78	
Satflow per lane	575	1826	1553	223	1826	1553		1710			1703	
Capacity/lane	329	1736	777	127	1736	777		616			613	
Flow ratio	0.20	0.41	0.02	0.41	0.22	0.01		0.23			0.05	
v/c ratio	0.35	0.83	0.05	0.72	0.44	0.03		0.63			0.13	
I factor	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Arrival type	3	3	3	3	3	3		3			3	
Platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
PF factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Q1	2.1	26.8	0.8	1.7	10.6	0.5		13.4			2.2	
kB	0.5	0.9	0.8	0.3	0.9	0.8		0.7			0.7	
Q2	0.3	3.6	0.0	0.6	0.7	0.0		1.1			0.1	
Q avg.	2.3	30.4	0.8	2.3	11.3	0.5		14.5			2.3	
Percentile Back of Queue (95th percentile)												
fb%	2.0	1.6	2.1	2.0	1.8	2.1		1.8			2.0	
BOQ, Q%	4.7	49.0	1.7	4.6	20.5	1.1		25.7			4.6	
Queue Storage Ratio												
Q spacing	25.0	25.0	25.0	25.0	25.0	25.0		25.0			25.0	
Q storage	0	0	0	0	0	0		75			0	
Avg. Rq								4.8				
95% Rq%								8.6				

LONG REPORT												
General Information						Site Information						
Analyst Agency or Co. Date Performed Time Period						Intersection Area Type Jurisdiction Analysis Year						
MAAI 2/27/2009 PM Peak Hour						Camp Creek Pkwy @ Butner Rd All other areas Fulton County 2009 existing						
Intersection Geometry												
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> <p>Grade = -3</p> <p>Grade = 0</p> </div> <div style="width: 45%; text-align: center;"> <p>Grade = 0</p> <p>Grade = 3</p> </div> </div>												
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (vph)	13	950	50	271	1111	34	45	73	136	30	140	27
% Heavy veh	4	4	4	4	4	4	0	4	0	0	4	0
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup lost time	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Ext. eff. green	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Arrival type	3	3	3	3	3	3		3			3	
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Ped/Bike/RTOR Volume	0		0	0		0	0		98	0		27
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0		12.0			12.0	
Parking (Y or N)	N		N	N		N	N		N	N		N
Parking/hr												
Bus stops/hr	0	0	0	0	0	0		0			0	
Ped timing	3.2			3.2			3.2			3.2		
	WB Only	EW Perm	03	04	NS Perm	06	07	08				
Timing	G = 21.0	G = 81.0	G =	G =	G = 33.0	G =	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 150.0						

VOLUME ADJUSTMENT AND SATURATION FLOW RATE WORKSHEET												
General Information												
Project Description <i>Butner Road Bridge Replacement Project</i>												
Volume Adjustment												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume	13	950	50	271	1111	34	45	73	136	30	140	27
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow Rate	14	1056	56	301	1234	38	50	81	42	33	156	0
Lane Group	L	T	R	L	T	R		LTR			LTR	
Adj. flow rate	14	1056	56	301	1234	38		173			189	
Prop. LT or RT	0.000	--	0.000	0.000	--	0.000	0.289	--	0.243	0.175	--	0.000
Saturation Flow Rate												
Base satflow	1900	1900	1900	1900	1900	1900		1900			1900	
Num. of lanes	1	2	1	1	2	1	0	1	0	0	1	0
fW	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
fHV	0.962	0.962	0.962	0.962	0.962	0.962		0.962			0.968	
fg	1.000	1.000	1.000	1.000	1.000	1.000		0.985			1.015	
fp	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
fbb	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
fa	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
fLU	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
fLT	0.132	1.000	--	0.950	1.000	--		0.776	--		0.908	--
Secondary fLT			--	0.174		--			--			--
fRT	--	1.000	0.850	--	1.000	0.850	--	0.967		--	1.000	
fLpb	1.000	1.000	--	1.000	1.000	--		1.000	--		1.000	--
fRpb	--	1.000	1.000	--	1.000	1.000	--	1.000		--	1.000	
Adj. satflow	241	3471	1553	1736	3471	1553		1380			1695	
Sec. adj. satflow			--	318		--			--			--

CAPACITY AND LOS WORKSHEET												
General Information												
Project Description <i>Butner Road Bridge Replacement Project</i>												
Capacity Analysis												
	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R		LTR			LTR	
Adj. flow rate	14	1056	56	301	1234	38		173			189	
Satflow rate	241	3471	1553	1736	3471	1553		1380			1695	
Lost time	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Green ratio	0.54	0.54	0.54	0.71	0.54	0.54		0.22			0.22	
Lane group cap.	130	1874	839	425	1874	839		304			373	
v/c ratio	0.11	0.56	0.07	0.71	0.66	0.05		0.57			0.51	
Flow ratio	0.06	0.30	0.04		0.36	0.02		0.13			0.11	
Crit. lane group	N	N	N	N	Y	N		Y			N	
Sum flow ratios	0.62											
Lost time/cycle	15.00											
Critical v/c ratio	0.69											
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Lane group	L	T	R	L	T	R		LTR			LTR	
Adj. flow rate	14	1056	56	301	1234	38		173			189	
Lane group cap.	130	1874	839	425	1874	839		304			373	
v/c ratio	0.11	0.56	0.07	0.71	0.66	0.05		0.57			0.51	
Green ratio	0.54	0.54	0.54	0.71	0.54	0.54		0.22			0.22	
Unif. delay d1	16.8	22.8	16.5	15.5	24.6	16.3		52.2			51.4	
Delay factor k	0.11	0.16	0.11	0.27	0.23	0.11		0.16			0.12	
Increm. delay d2	0.4	0.4	0.0	5.4	0.9	0.0		2.5			1.1	
PF factor	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Control delay	17.2	23.2	16.5	20.9	25.5	16.3		54.7			52.5	
Lane group LOS	B	C	B	C	C	B		D			D	
Apprch. delay	22.8			24.4			54.7			52.5		
Approach LOS	C			C			D			D		
Intersec. delay	27.3			Intersection LOS					C			

SUPPLEMENTAL UNIFORM DELAY WORKSHEET FOR LEFT TURNS FROM EXCLUSIVE LANES WITH PROTECTED AND PERMITTED PHASES					
General Information					
Project Description <i>Butner Road Bridge Replacement Project</i>					
v/c Ratio Computation					
	EB	WB	NB	SB	
Cycle length, C (s)	150.0				
Prot. phase eff. green intvl, g (s)		21.0			
Opposed queue eff. green intvl, g _q (s)		30.82			
Unopposed green intvl, g _u (s)		55.18			
Red time, r(s)		43.0			
Arrival rate, q _a (veh/s)		0.08			
Prot. phase departure rate, s _p (veh/s)		0.482			
Perm. phase departure rate, s _s (veh/s)		0.14			
X _{perm}		0.95			
X _{prot} (N/A for lagging left-turns)		0.53			
Uniform Queue Size and Delay Computations					
Queue at start of green arrow, Q _a		3.60			
Queue at start of unsaturated green, Q _u		2.58			
Residual queue, Q _r		0.00			
Uniform delay, d ₁		15.5			
Uniform Queue Size and Delay Equations					
	Case	Q _a	Q _u	Q _r	d ₁
If X _{perm} ≤ 1.0 & X _{prot} ≤ 1.0	1	q _a r	q _a g _q	0	$[0.5/(q_a C)][rQ_a + Q_a^{2(s_p - q_a)} + g_q Q_u + Q_u^{2(s_s - q_a)}$
If X _{perm} ≤ 1.0 & X _{prot} > 1.0	2	q _a r	Q _r + q _a g _q	Q _a - g(s _p - q _a)	$[0.5/(q_a C)][rQ_a + g(Q_a + Q_r) + g_q(Q_r + Q_u) + Q_u^{2(s_s - q_a)}$
If X _{perm} > 1.0 & X _{prot} ≤ 1.0	3	Q _r + q _a r	q _a g _q	Q _u - g _u (s _s - q _a)	$[0.5/(q_a C)][g_q Q_u + g_u(Q_a + Q_r) + r(Q_r + Q_a) + Q_a^{2(s_p - q_a)}$
If X _{perm} ≤ 1.0 (lagging lefts)	4	0	q _a (r + g _q)	0	$[0.5/(q_a C)][r + g_q]Q_u + Q_u^{2(s_s - q_a)}$
If X _{perm} > 1.0 (lagging lefts)	5	Q _u - g _u (s _s - q _a)	q _a (r + g _q)	0	$[0.5/(q_a C)][r + g_q]Q_u + g_u(Q_u + Q_a) + Q_a^{2(s_p - q_a)}$

BACK-OF-QUEUE WORKSHEET												
General Information												
Project Description <i>Butner Road Bridge Replacement Project</i>												
Average Back of Queue												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane group	L	T	R	L	T	R		LTR			LTR	
Init. queue/lane	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Flow rate/lane	14	1056	56	301	1234	38		173			189	
Satflow per lane	241	1826	1553	596	1826	1553		1380			1695	
Capacity/lane	130	1874	839	425	1874	839		304			373	
Flow ratio	0.06	0.30	0.04	0.51	0.36	0.02		0.13			0.11	
v/c ratio	0.11	0.56	0.07	0.71	0.66	0.05		0.57			0.51	
I factor	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Arrival type	3	3	3	3	3	3		3			3	
Platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
PF factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Q1	0.3	15.3	1.1	4.0	19.3	0.7		6.4			6.9	
kB	0.3	0.9	0.8	0.6	0.9	0.8		0.5			0.5	
Q2	0.0	1.2	0.1	1.3	1.7	0.0		0.6			0.5	
Q avg.	0.3	16.5	1.2	5.3	21.0	0.8		7.0			7.4	
Percentile Back of Queue (95th percentile)												
fB%	2.1	1.7	2.1	1.9	1.7	2.1		1.9			1.9	
BOQ, Q%	0.7	28.6	2.4	10.2	35.5	1.6		13.4			14.1	
Queue Storage Ratio												
Q spacing	25.0	25.0	25.0	25.0	25.0	25.0		25.0			25.0	
Q storage	0	0	0	0	0	0		75			0	
Avg. Rq								2.3				
95% Rq%								4.5				

Hydraulic Design Considerations

The proposed project site is located in Fulton County which participates in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). The Community Flood Insurance Rate Map (FIRM) effective date is June 22, 1998 (Fulton County, FIRM Map Number 13121C0341 E, effective date June 22, 1998).

The proposed bridge is located in a designated flood zone AE, with base flood elevations (BFEs) and regulatory floodway established for this reach of Camp Creek. The effect of the proposed bridge and all the work necessary to address FEMA-related issues are the subject of a separate study, which is presented on a separate report.

Comparison of the results from the simulations using the existing conditions model and the proposed conditions model shows that the proposed conditions would not create an increase in the BFEs, floodway WSELs and floodway widths at any cross section outside of the County's right of way.

In conclusion, the results from the analysis are such that a "No-Rise" Certification can be issued for this reach of Camp Creek. Coordination with FEMA is not required but coordination with Community is required.

We have considered three (3) alternative bridge layouts to accommodate the roadway design.

Alternative I, is a 90-ft long span, made of 54" bulb-tee PSC beams.

Alternative II, utilizes is a two span bridge (65 ft each), that consists of AASHTO type II beams. This span arrangement requires a middle bent, in the main channel of Camp Creek.

Alternative III consists of a single, 130-ft long span structure, made of 65" bulb-tee PSC beams.

Georgia DOT design criteria require that, for this type of road, the proposed bridge provide a minimum of 2.0 ft of clearance above the design-year storm floodstage, and a minimum of 0.5 ft of clearance above the 100-year storm floodstage. The design-year storm in this case is the 50-year storm event.

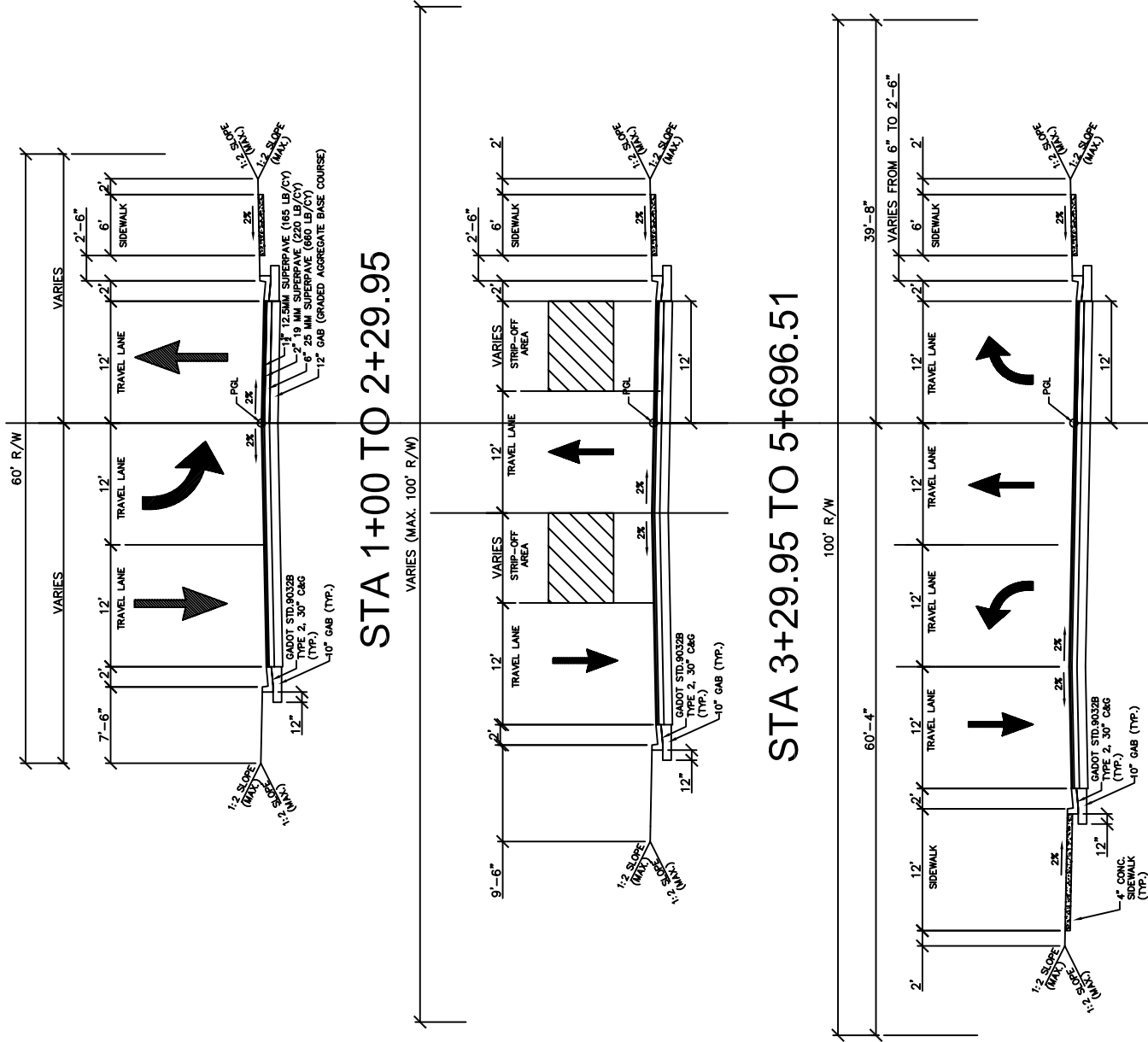
Based on the results from simulations of the proposed conditions, Alternative III meets this criterion.

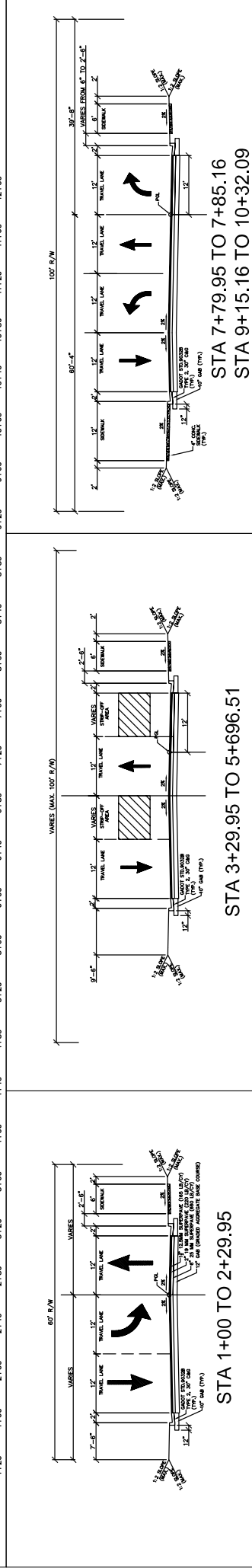
Also, the backwater values, which are calculated by measuring the effect of the existing and the proposed encroachment on the floodplain over the natural conditions, have to be considered in the design of the proposed bridge.

Georgia DOT design criteria require that the backwater be less than 1.0 ft. Alternative III meets this criterion too.

Hydraulically, the other two alternatives do not work as well as Alternative III, taking into account the width of the main channel.

TYPICAL CROSS SECTION



[illegible]

Estimate Report for file "Butner Road -2010-05-27"

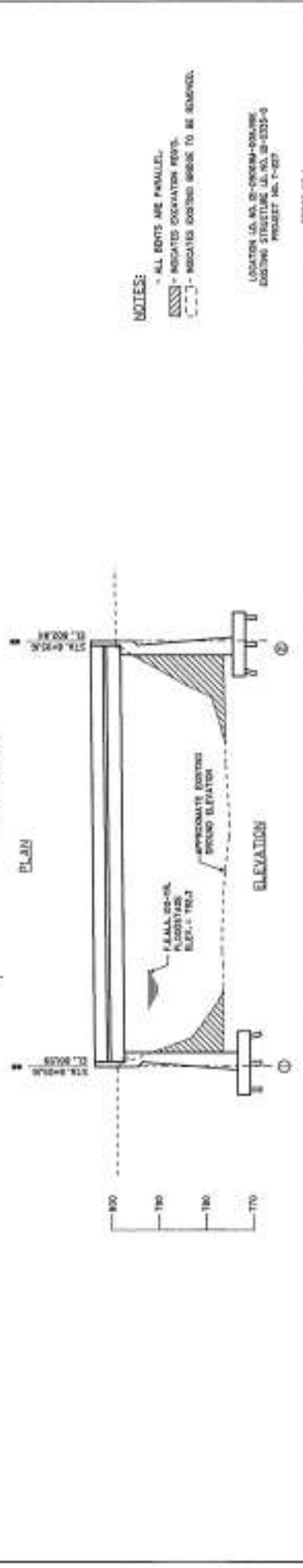
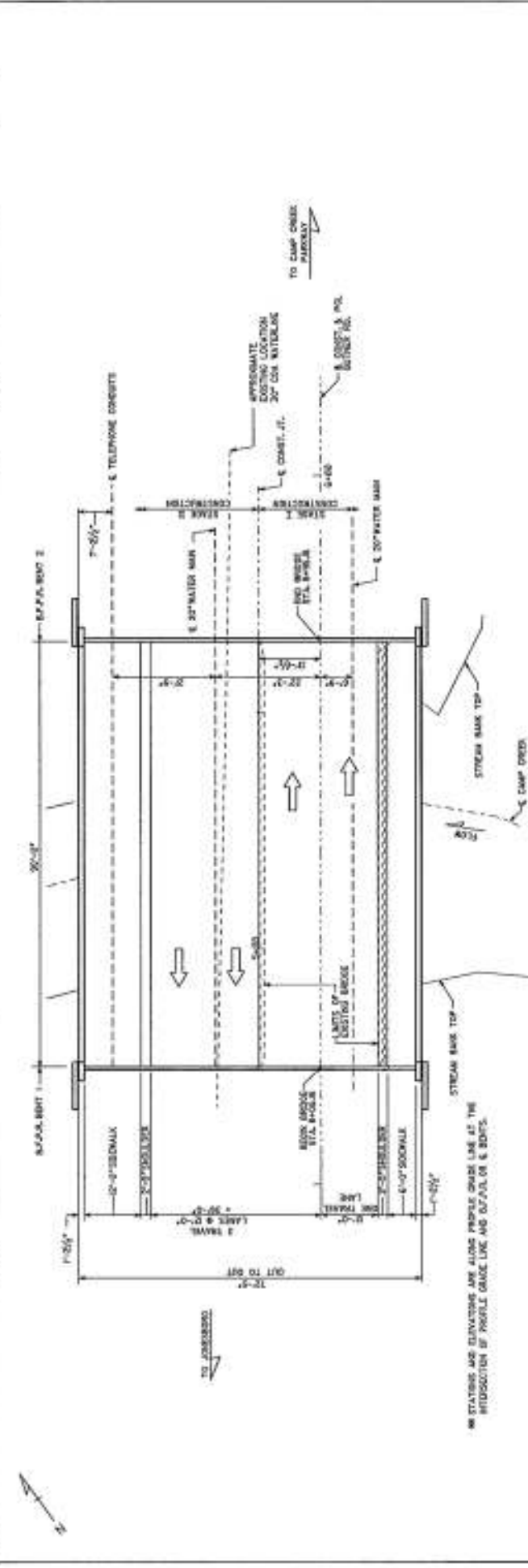
Section Roadway					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	20000.0	TRAFFIC CONTROL -	20000.0
153-1300	1	EA	40750.0	FIELD ENGINEERS OFFICE & Mobilization	40750.0
201-1500	1	LS	50000.0	CLEARING & GRUBBING -	50000.0
210-0100	1	LS	705000.0	GRADING COMPLETE -	705000.0
310-5100	3300	SY	16.44	GR AGGR BASE CRS, 12 INCH, INCL MATL	54252.00
402-1812	60	TN	69.41	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	4164.59
402-3121	257	TN	59.9	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	15394.3
402-3130	20	TN	64.18	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	1283.60
402-3190	30	TN	67.17	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	2015.10
413-1000	200	GL	2.13	BITUM TACK COAT	426.0
432-0208	1300	SY	5.64	MILL ASPH CONC PVMT, 2 IN DEPTH	7332.0
441-0016	35	SY	41.13	DRIVEWAY CONCRETE, 6 IN TK	1439.55
441-0104	1023	SY	32.82	CONC SIDEWALK, 4 IN	33574.86
441-6012	1823	LF	16.09	CONC CURB & GUTTER, 6 IN X 24 IN, TP 2	29332.07
550-1240	400	LF	46.58	STORM DRAIN PIPE, 24 IN, H 1-10	18632.0
550-4224	2	EA	744.82	FLARED END SECTION 24 IN, STORM DRAIN	1489.64
603-2182	2	SY	53.72	STN DUMPED RIP RAP, TP 3, 24 IN	107.44
610-1055	600	LF	2.11	REM GUARDRAIL	1266.0
610-1075	4	EA	160.89	REM GUARDRAIL ANCH, ALL TYPES	643.56
641-1200	916	LF	17.6	GUARDRAIL, TP W	16121.60
641-5005	4	EA	1008.31	GUARDRAIL ANCHORAGE, TP 5	4033.24
668-1100	4	EA	2541.9	CATCH BASIN, GP 1	10167.6
668-4300	2	EA	2250.04	STORM SEWER MANHOLE, TP 1	4500.08
Section Sub Total:					\$1,021,925.24

Section Signing and Marking					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
611-5551	12	EA	368.24	RESET SIGN	4418.88
634-1200	12	EA	99.08	RIGHT OF WAY MARKERS	1188.96
652-5301	2400	LF	0.15	SOLID TRAF STRIPE, 6 IN, WHITE	360.0
652-5452	2400	LF	0.21	SOLID TRAFFIC STRIPE, 5 IN, YELLOW	504.0
652-5701	14	LF	2.1	SOLID TRAF STRIPE, 24 IN, WHITE	29.40
653-0300	14	EA	200.0	THERMOPLASTIC PVMT MARKING, SYMBOL, TP 1	2800.0
654-1001	70	EA	3.06	RAISED PVMT MARKERS TP 1	214.20
Section Sub Total:					\$9,515.44

Section Erosion Control Items					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	1	AC	385.22	TEMPORARY GRASSING	385.22
163-0240	5	TN	172.38	MULCH	861.9
163-0300	2	EA	1234.88	CONSTRUCTION EXIT	2469.76
163-0524	4	EA	183.88	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS - STONE PLAIN RIP RAP/SAND BAGS	735.52
163-0531	2	EA	10913.09	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO -	21826.18
165-0030	1400	LF	0.78	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	1092.0
165-0040	24	EA	57.2	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	1372.80
165-0041	240	LF	1.94	MAINTENANCE OF CHECK DAMS - ALL TYPES	465.59
167-1000	10	EA	597.96	WATER QUALITY MONITORING AND SAMPLING	5979.6
171-0030	1400	LF	3.46	TEMPORARY SILT FENCE, TYPE C	4844.0
700-6910	2	AC	825.66	PERMANENT GRASSING	1651.32
700-7000	3	TN	63.09	AGRICULTURAL LIME	189.27
700-7010	6	GL	21.49	LIQUID LIME	128.94
700-8000	1	TN	384.56	FERTILIZER MIXED GRADE	384.56
700-8100	50	LB	2.3	FERTILIZER NITROGEN CONTENT	114.99
716-2000	2500	SY	0.96	EROSION CONTROL MATS, SLOPES	2400.0
Section Sub Total:					\$44,901.67

Total Estimated Cost: \$1,076,342.35

Subtotal Construction Cost	\$1,076,342.35
E&C Rate 10.0 %	\$107,634.23
Inflation Rate 2.0 % @ 1 Years	\$23,679.53
<hr/>	
Total Construction Cost	\$1,207,656.12
Right Of Way	40000.00
ReImb. Utilities	0.00
<hr/>	
Grand Total Project Cost	\$1,247,656.12



NOTES:
 - ALL DIMS ARE PARALLEL
 - HATCHES INDICATE EXISTING FEATS.
 - DASHED LINES INDICATE PROPOSED FEATS TO BE REMOVED.

LOCATION: U.S. NO. 20-CHERRY-ROAD
 EXISTING STRUCTURE: U.S. NO. 20-225-0
 PROJECT NO. 1-227

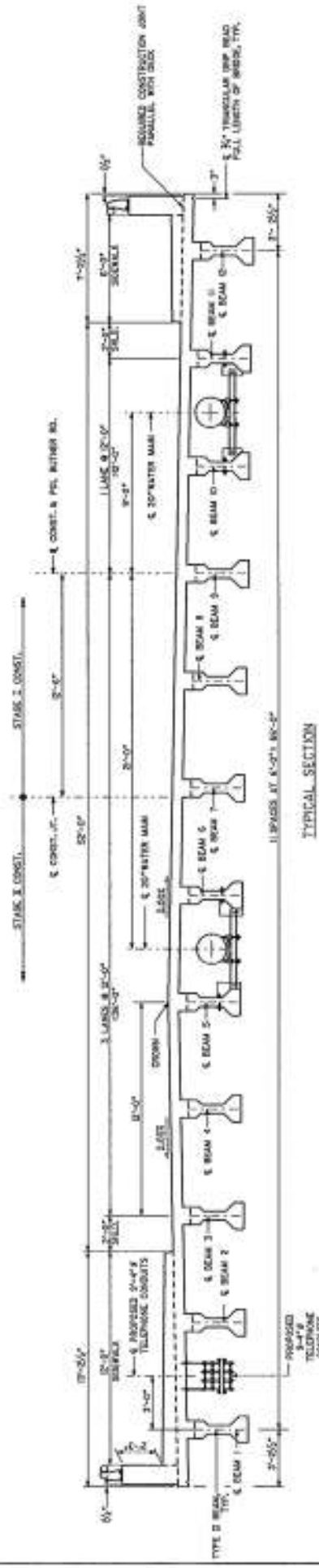
GEORGIA DEPARTMENT OF TRANSPORTATION
 REGIONAL OFFICE - BUTNER ROAD OVER CAMP CREEK
 CONCEPT - ALTERNATIVE 1
 BUTNER ROAD OVER CAMP CREEK
 FULTON COUNTY
 MAY 2000

Maryland Asphalt Association, Inc.
 10000 Rockledge Road
 Rockville, MD 20850
 Tel: (301) 340-1400

Cost Estimate
Alternative 1
 1 Span
 BT-54/Abut Walls

Project : 08504 Butner Road Over Camp Creek
 Project Number : T227
 Made By : QSJ Date : 25-May-10
 Checked By : - Date : -

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
170	500-0100	GROOVED CONCRETE	833	SY	\$ 4.67	\$ 3,891.67
171	500-1006	SUPERSTR CONCRETE, CL AA, BR NO -	218	LS	\$ 762.56	\$ 166,125.63
187	500-3800	CLASS A CONCRETE, INCL REINF STEEL	614	CY	\$ 628.37	\$ 385,819.18
198	507-9030	PSC BEAMS, AASHTO, BULB TEE, 54 IN, BR NO -	900	LF	\$ 162.30	\$ 146,070.00
202	511-1000	BAR REINF STEEL		LB	\$ 0.88	
203	511-3000	SUPERSTR REINF STEEL, BR NO -	59256	LS	\$ 0.92	\$ 54,515.42
207	516-1100	ALUM HANDRAIL, STD 3626	180	LF	\$ 54.15	\$ 9,747.00
218	520-1147	PILING IN PLACE, STEEL H, HP 14 X 73	720	LF	\$ 72.18	\$ 51,969.60
250	522-1000	SHORING	1	LS	\$ 121,892.50	\$ 121,892.50
253	520-1320	COFFERDAM	2	EA	\$ 14,361.48	\$ 28,722.96
259	540-1101	REMOVAL OF EXISTING BR, STA NO -	1	LS	\$ 115,792.88	\$ 115,792.88
350	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	468	SY	\$ 48.24	\$ 22,587.37
355	603-7000	PLASTIC FILTER FABRIC	468	SY	\$ 4.42	\$ 2,069.57
432	627-1020	MSE WALL FACE, 20 - 30 FT HT, WALL NO -	4000	SF	\$ 56.00	\$ 224,000.00
Bridge Sub Total =						\$ 1,333,203.78
Deck Area Per Side (sq ft) = BL (BW) =						\$ 6,517.50
Unit Cost (\$ / sq ft) =						\$ 204.56
5% Mobilization						\$ 66,660.00
5% MOT						\$ 66,660.00
2% Contingency						\$ 26,664.00
Total Bridge Cost =						\$ 1,493,187.78



CONSTRUCTION SEQUENCE

1. REMOVE EXISTING BRIDGE.
2. BUILD STAGE I CONSTRUCTION.
3. PLACE FIRST 20' @ WATER MAIN ON STAGE I CONSTRUCTION.
4. REMOVE EXISTING 30" WATER MAIN AND SUPPORTING STRUCTURE.
5. BUILD STAGE II CONSTRUCTION.
6. PLACE SECOND 20' @ WATER MAIN.
7. PLACE EXISTING BRIDGE FOR TRAFFIC.
8. BEGIN ENTIRE BRIDGE FOR TRAFFIC.

 MA Associates, Inc. 2000 Peachtree Industrial Blvd., NE Atlanta, Georgia 30329 Tel. 404/251-1946	REVISIONS			2000002	304
	BY	DATE	DESCRIPTION	SALMON	00P
				05/03/83	10E
				2007 SALMON	
				05/15/83	
				APPROVED	

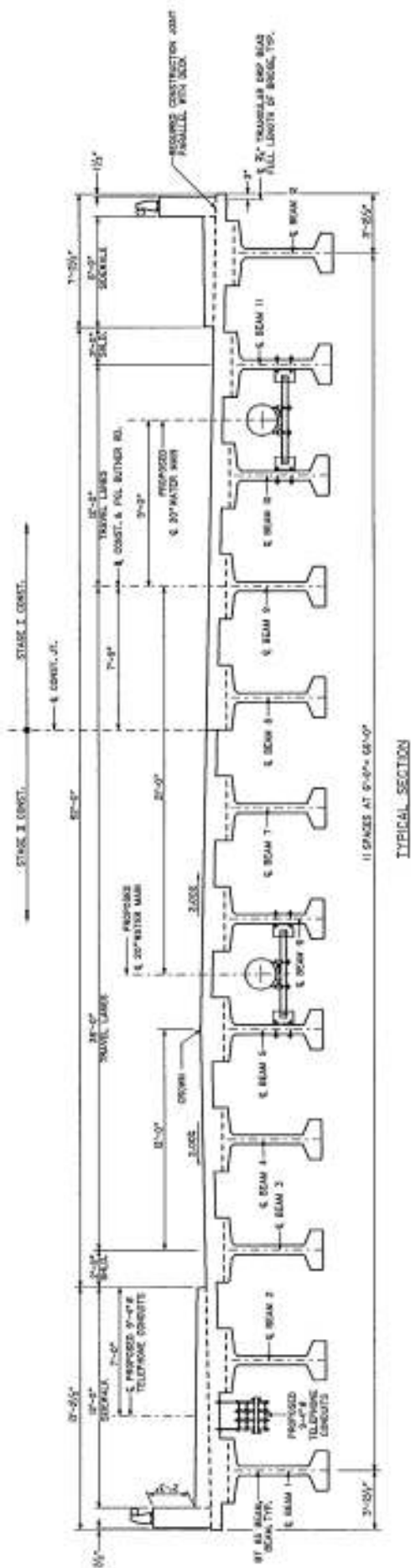
Cost Estimate**Alternative 2**

2 Spans

TP II/Endrolls

Project : 08504 Butner Road Over Camp Creek
 Project Number : T227
 Made By : QSJ Date : 25-May-10
 Checked By : - Date : -

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
65	211-0300	BRIDGE EXCAVATION, STREAM CROSSING	38	CY	\$ 29.59	\$ 1,134.28
170	500-0100	GROOVED CONCRETE	1056	SY	\$ 4.67	\$ 4,929.44
171	500-1006	SUPERSTR CONCRETE, CL AA, BR NO -	282	LS	\$ 762.56	\$ 215,054.02
176	500-3002	CLASS AA CONCRETE	210	CY	\$ 488.44	\$ 102,409.59
195	507-9002	PSC BEAMS, AASHTO TYPE II, BR NO -	1560	LF	\$ 124.69	\$ 194,516.40
202	511-1000	BAR REINF STEEL	30821	LB	\$ 0.88	\$ 27,122.48
203	511-3000	SUPERSTR REINF STEEL, BR NO -	76708	LS	\$ 0.92	\$ 70,571.65
207	516-1100	ALUM HANDRAIL, STD 3626	260	LF	\$ 54.15	\$ 14,079.00
218	520-1147	PILING IN PLACE, STEEL H, HP 14 X 73	1440	LF	\$ 72.18	\$ 103,939.20
250	522-1000	SHORING	1	LS	\$ 121,892.50	\$ 121,892.50
253	520-1320	COFFERDAM	3	EA	\$ 14,361.48	\$ 43,084.44
259	540-1101	REMOVAL OF EXISTING BR, STA NO -	1	LS	\$ 115,792.88	\$ 115,792.88
350	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	468	SY	\$ 48.24	\$ 22,587.37
355	603-7000	PLASTIC FILTER FABRIC	468	SY	\$ 4.42	\$ 2,089.57
432	627-1020	MSE WALL FACE, 20 - 30 FT HT, WALL NO -	4000	SF	\$ 44.37	\$ 177,480.00
Bridge Sub Total =						\$ 1,216,662.82
Deck Area Per Side (sq ft) = BL (BW) =						\$ 9,414.17
Unit Cost (\$ / sq ft) =						\$ 129.24
5% Mobilization						\$ 60,833.00
5% MOT						\$ 60,833.00
2% Contingency						\$ 24,333.00
Total Bridge Cost =						\$ 1,362,661.82



TYPICAL SECTION

CONSTRUCTION SEQUENCE

1. REMOVE EXISTING BRIDGE.
2. BUILD STAGE 1 CONSTRUCTION.
3. PLACE FIRST 20' # 4 WATER MAIN ON STAGE 1 CONSTRUCTION.
4. REMOVE EXISTING 30" WATER MAIN AND SUPPORTING STRUCTURE.
5. BUILD STAGE 2 CONSTRUCTION.
6. PLACE SECOND 20' # 4 WATER MAIN & TELEPHONE CIRCUITS ON STAGE 2 CONSTRUCTION.
7. OPEN ENTIRE BRIDGE FOR TRAFFIC.

 Marshall Allen & Associates, Inc. 20000 1st Ave. NE, Suite 100 Bellevue, WA 98004 Tel: 206 465-8800		PROJECT NO. 35-0002
		SHEET NO. 35-0002
FULTON COUNTY DEPARTMENT OF PUBLIC WORKS OFFICE OF TRANSPORTATION PLANNING		
TYPICAL SECTION - ALTERNATIVE 3 BUTNER ROAD OVER BUTNER CREEK		
T-227 FULTON COUNTY		
SCALE: 1/8" = 1'-0" MAT 500		

Cost Estimate
Alternative 3
1 Span
BT-65/ENDROLLS

Project : 08504 Butner Road Over Camp Creek
Project Number : T227
Made By : QSJ Date : 25-May-10
Checked By : - Date : -

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
170	500-0100	GROOVED CONCRETE	1056	SY	\$ 4.67	\$ 4,929.44
171	500-1006	SUPERSTR CONCRETE, CL AA, BR NO -	299	LS	\$ 762.56	\$ 227,673.96
177	500-3101	CLASS A CONCRETE	37	CY	\$ 246.73	\$ 9,046.77
199	507-9031	PSC BEAMS, AASHTO, BULB TEE, 63 IN, BR NO -	1560	LF	\$ 185.45	\$ 289,302.00
202	511-1000	BAR REINF STEEL	5390	LB	\$ 0.88	\$ 4,743.20
203	511-3000	SUPERSTR REINF STEEL, BR NO -	81210	LS	\$ 0.92	\$ 74,712.98
207	516-1100	ALUM HANDRAIL, STD 3626	260	LF	\$ 54.15	\$ 14,079.00
218	520-1147	PILING IN PLACE, STEEL H, HP 14 X 73	720	LF	\$ 72.18	\$ 51,969.60
250	522-1000	SHORING	1	LS	\$ 121,892.50	\$ 121,892.50
259	540-1101	REMOVAL OF EXISTING BR, STA NO -	1	LS	\$ 115,792.88	\$ 115,792.88
350	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	468	SY	\$ 48.24	\$ 22,587.37
355	603-7000	PLASTIC FILTER FABRIC	468	SY	\$ 4.42	\$ 2,089.57
432	627-1020	MSE WALL FACE, 20 - 30 FT HT, WALL NO -	4000	SF	\$ 44.37	\$ 177,480.00

Bridge Sub Total = \$ 1,116,279.27
Deck Area Per Side (sq ft) = BL (BW) = \$ 9,414.17
Unit Cost (\$ / sq ft) = \$ 118.57

5% Mobilization \$ 55,814.00
5% MOT \$ 55,814.00
2% Contingency \$ 22,326.00

Total Bridge Cost = \$ 1,250,233.27

Cost Estimate Summary

Project : 08504 Butner Road Over Camp Creek
 Project Number : T227
 Made By : Q.S.J. Date : 25-May-10
 Checked By : - Date : -

BR No.	Bridge Description	Estimated Cost
1	Alternative 1, 90 Feet Single Span Bridge with Abutments	\$ 1,493,187.78
1	Alternative 2, 130 Feet Bridge with Two 65 Feet Spans and End Rolls	\$ 1,362,661.82
1	Alternative 3, 130 Feet Single Span Bridge with End Rolls	\$ 1,250,233.27

Total Bridge Sq FT= 9414
 Price/Sq FT= \$ 118.57

PREFERRED ALTERNATIVE IS #3

BRIDGE INVENTORY DATA LISTING GEORGIA DEPARTMENT OF TRANSPORTATION

Structure ID: 121-0355-0

Fulton Area 9

SUPP. RATING

19.00

Location & Geography

* Structure I.D. No.: 121-0355-0
 * 200 Bridge Information: 07
 * 6A Feature Int: CAMP CREEK
 * 6B Critical Bridge: 0
 * 7A Route Number Carried: CR01374
 * 7B Facility Carried: BUTNER ROAD
 * 9 Location: 5.8 MI W OF COLLEGE PARK

* 2 DOT District: 7
 * 207 Year Photo: 1999
 * 91 Inspection Frequency: 24 Date: 10/20/2004
 * 92A Fract Crit Insp Freq: 00 Date: 02/01/1901
 * 92B Underwater Insp Freq: 60 Date: 06/20/2006
 * 92C Other Spec. Insp Freq: 00 Date: 02/01/1901

* 4 Place Code: 00000
 * 5 Inventory Route (OU): 1
 * Type: 4
 * Designation: 1
 * Number: 09069
 * Direction: 0

* 16 Latitude: 33-40.1 MMS Prefix: 00
 * 17 Longitude: 84-32.8 MMS Suffix: 000 MP: 0.00
 * 98 Border Bridge: 000 %Shared: 00
 * 99 ID Number: 000000000000000

* 100 STRAINNET: 0
 * 12 Base Highway Network: 1
 * 13A LRS Inventory Route: 1212137400
 * 13B Sub Inventory Route: 0
 * 101 Parallel Structure: N
 * 102 Direction of Traffic: 2
 * 264 Road Inventory Mile Post: 009.15
 * 208 Inspection Area: 09 Initials: JMC
 * Engineer's Initial: sym

* Location I.D. No.: 121-09069M-008.95E

Report Date: 2/19/2007

SIA-1

Signs & Attachments

* 104 Highway System: 0
 * 26 Functional Classification: 16
 * 204 Federal Route Type: M No.: 09069
 * 105 Federal Lands Highway: 0
 * 110 Truck Route: 0
 * 206 School Bus Route: 1
 * 217 Benchmark Elevation: 8000.00
 * 218 Datum: 0
 * 19 Bypass Length: 06
 * 20 Toll: 3
 * 21 Maintenance: 02
 * 22 Owner: 02
 * 31 Design Load: 2
 * 37 Historical Significance: 5
 * 205 Congressional District: 05
 * 27 Year Constructed: 1946
 * 106 Year Reconstructed: 0000
 * 33 Bridge Median: 0
 * 34 Skew: 00
 * 35 Structure Flared: 0
 * 38 Navigation Control: 0
 * 213 Special Steel Design: 0
 * 267 Type of Paint: 2
 * 42 Type of Service on: 1
 * 214 Movable Bridge: 0
 * 203 Type Bridge: I-O-M-O
 * 259 Pile Encasement: 3
 * 43 Structure Type Main: 3 02
 * 45 No. Spans Main: 003
 * 44 Structure Type Appr: 0 00
 * 46 No. Spans Appr: 0000
 * 226 Bridge Curve Horiz: 0 Vert: 0
 * 111 Pier Protection: 0
 * 107 Deck Structure Type: 1
 * 108 Wearing Surface Type: 6
 * 248 County Continuity No.: 00

277 268
 1327
 45

M
 F
 0

BRIDGE INVENTORY DATA LISTING GEORGIA DEPARTMENT OF TRANSPORTATION

19.00

SUFF. RATING

Fulton Area 9

Structure ID: 121-0355-0

Programming Data

201 Project No.: UNKNOWN
 202 Plans Available: 0
 249 Prop. Proj. No.: 000000000000000000
 250 Approval Status: 0000
 251 P.I. No.: 00000000
 252 Contract Date: 02/01/1901
 260 Science No.: 00000
 75 Type Work: 31 1
 94 Bridge Imp. Cost: \$ 143
 95 Roadway Imp. Cost: \$ 337
 96 Total Imp Cost: \$ 546
 76 Imp. Length: 001410
 97 Imp. Year: 1990
 114 Future ADT: 003975 Year: 2025

Measurements

* 29 ADT: 002650 Year: 2005
 109 % Trucks: 0
 * 28 Lanes On: 02 Under: 00
 210 No. Trucks On: 00 Under: 00
 * 48 Max. Span Length: 0030
 * 49 Structure Length: 90
 51 Br. Rwdy. Width: 24.00
 52 Deck Width: 29.00
 * 47 Tot. Horz. Cl: 24.00
 50 Curb/SideWalk Width: 1.00/1.00
 32 Approach Rdwy Width: 024
 * 229 Shoulder Width:

Rear Lt: 5.00 Type: 8 Rt: 5.00
 Fwd Lt: 1.50 Type: 1 Rt: 1.50

Pavement Width:

Rear: 24.00 Type: 2
 Fwd: 24.00 Type: 2

Intersection Rear: 0 Fwd: 1

36 Safety Features Br. Rail:

Transition:

App. G. Rail: 0

App. Rail End: 0

53 Minimum CLOver:

Under: N

* 228 Min. Vertical Cl

Act. Odm Dir:

Oppo. Dir:

Posted Odm. Dir:

Oppo. Dir:

55 Lateral Underrel. Rt:

56 Lateral Underrel. Lt:

* 10 Max Min Vert Cl:

39 Nav Vert Cl:

116 Nav Vert Cl Closed:

245 Deck Thickness Main:

Deck Thick Approach:

246 Overlay Thickness:

212 Year Last Painted:

Sup: 2004 Sub: 0000

Hydraulic Data

215 Waterway Data

Highwater Elev.: 0000.0 Year: 1900

Avg. Streambed Elev.: 0000.0 Freq.: 00

Drainage Area: 00000

Area Of Opening: 000000

113 Scour Critical: U

216 Water Depth: 01.0 Br. Height: 22.6

222 Slope Protection: 0

221 Spur Dikes Rear: 0 Fwd: 0

219 Fender System: 0

220 Dolphin: 0

223 Culvert Cover: 000

Type: 0

No. Barrels: 0

Width: 0.00 Height: 0.00

Length: 0 Apron: 0

* 265 U/W Insp. Area: 1 Diver: RM

* Location I.D. No.: 121-09069M-008.951

Ratings

65 Inventory Rating Method: 2
 63 Inventory Rating Method: 2
 66 Inventory Type: 2 Rating: 15
 64 Operating Type: 2 Rating: 27
 231 Calculated Loads

H-Modified: 11 1

HS-Modified: 17 0

Type 3: 14 1

Type 3a2: 27 0

Timber: 20 1

Piggyback: 00 0

261 H Inventory Rating: 10

262 H Operating Rating: 17

67 Structural Evaluation: 4

58 Deck Condition: 7

59 Superstructure Condition: 6

* 227 Collision Damage: 0

60A Substructure Condition: 4

60B Scour Condition: 8

60C Underwater Condition: 5

71 Waterway Adequacy: 6

61 Channel Protection Cond: 6

68 Deck Geometry: 2

69 UnderClr. Horz/Vert: N

72 Appr. Alignment: 8

62 Culvert: N

Posting Data

70 Bridge Posting Required: 3

41 Street Open, Posted, Cl: P

* 103 Temporary Structure: 0

232 Posted Loads H-Modified: 11

HS-Modified: 00

Type 3: 14

Type3a2: 00

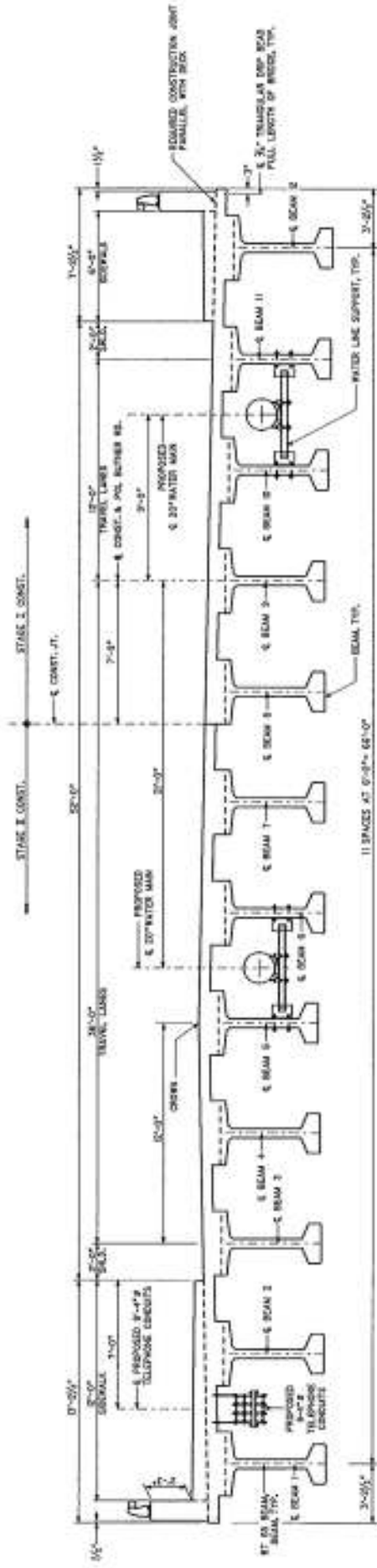
Timber: 20

Piggyback: 00

253 Notification Date: 02/01/1901

253 Fed Notify Date: 02/01/1901

0



COST DIVISION

- 1. TO BE PAID BY RUTHER COUNTY
 - COST OF DEWAS
- 2. TO BE PAID BY CITY OF ATLANTA
 - COST OF WATER LINC
 - WATER LINC CONNECTIONS TO WATER LINC SUPPORT
 - WATER LINC SUPPORT
 - CONNECTION TO BRAM
- 3. COST - MATERIALS AND INSTALLATION

CONSTRUCTION SEQUENCE

1. REMOVE EXISTING BRIDGE.
2. BUILD STAGE 1 CONSTRUCTION.
3. PLACE FIRST 20' # WATER MAIN ON STAGE 1 CONSTRUCTION.
4. REMOVE EXISTING 32" WATER MAIN AND SUPPORTING STRUCTURE.
5. BUILD STAGE 2 CONSTRUCTION.
6. PLACE SECOND 20' # WATER MAIN & TELEPHONE CONDUITS ON STAGE 2 CONSTRUCTION.
7. OPEN ENTIRE BRIDGE FOR TRAFFIC.